

## **REMARKS**<sup>1</sup>

In the outstanding Office Action, the Examiner objected to claim 12; rejected claims 15-20 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,172,365 to Hiroi et al. (Hiroi); rejected claims 8-14 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,222,195 to Yamada et al. (Yamada); and rejected claims 1-7 under 35 U.S.C. § 103(a) as being obvious over U.S. Patent Application Publication No. 2001/0019407 to Sato et al. (Sato) in combination with Hiroi.

By this amendment, Applicant has amended claims 1, 2, 9, 12, and 16. Claims 1-20 remain pending in this application.

### **I. Claim Objection**

In response to the Examiner's objection to claim 12, Applicant has amended claim 12 to depend from claim 8. Accordingly, Applicant respectfully requests that the Examiner withdraw the objection to claim 12.

### **II. Rejections under 35 U.S.C. § 102**

Applicant respectfully traverses the Examiner's rejection of claims 8-20 under 35 U.S.C. § 102(b). In order to properly anticipate Applicant's claimed invention under 35 U.S.C. § 102, each and every element of the claim in issue must be found, "either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Moreover, "[t]he identical invention must be shown in as complete detail as is contained

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<sup>1</sup> The Office Action contains statements reflecting characterizations of the related art and the claims. Regardless of whether any such statement is identified herein, Applicant declines to automatically subscribe to any statement or characterization in the Office Action.

in the . . . claim. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).” See MPEP § 2131, 8th Ed. (Rev. 6), September, 2007.

A. Claims 15-20

Hiroi cannot anticipate claims 15-20 because that reference fails to disclose each and every element recited in the claims. For example, Hiroi fails to disclose a combination including “placing a plurality of imaging components deviating from an optical conjugate plane of a surface of the inspection resist film,” as recited in claim 15.

Hiroi discloses forming an insulator film on a semiconductor substrate to form a semiconductor wafer (col. 33, lines 29-31), and detecting patterns on the semiconductor wafer by detecting materials formed on the wafer (col. 12, lines 4-15). To the extent that the insulator film and materials of Hiroi can reasonably be construed as respectively corresponding to Applicant’s claimed “inspection resist film” and “imaging components,” Hiroi fails to disclose that the materials deviate from an optical conjugate plane of the insulator film. Hiroi thus fails to disclose a combination including “placing a plurality of imaging components deviating from an optical conjugate plane of a surface of the inspection resist film,” as recited in claim 15 (emphasis added).

Applicant notes that FIGs. 6A to 6E of Hiroi shows a pattern on a semiconductor wafer, formed by a material A3 and a material B4. In addition, FIGs. 6A to 6E of Hiroi, and the associated description, disclose that a difference in the image signal detected by the sensor 11 according to whether the scan direction of the electron beam is the X direction or Y direction because of the charge-up ease phenomenon in the pattern. Hiroi, col. 14, line 33-39. This cannot constitute a teaching of “placing a plurality of

imaging components deviating from an optical conjugate plane of a surface of the inspection resist film,” as recited in claim 15. Moreover, the object of Hiroi for inspection by using an electron beam is the semiconductor wafer, or a photomask, thin film multiplayer substrate, printed circuit board or TFT substrate (see Hiroi, col. 11, lines 36-39), which is clearly different from the claimed invention, as recited in claim 15.

For at least the foregoing, Hiroi cannot anticipate claim 15. Claim 15 is thus allowable over Hiroi, and claims 16-20 are allowable at least due to their dependence from claim 15. Accordingly, Applicant respectfully requests that the Examiner withdraw the rejection of claims 15-20 under 35 U.S.C. § 102(b).

B. Claims 8-14

Yamada cannot anticipate claims 8-14 because Yamada fails to disclose each and every element recited in the claims. For example, Yamada fails to disclose a combination including “inspection patterns obtained by projecting exposure beams output from a plurality of effective light sources onto the resist film coated on a surface of an exposure target substrate by a plurality of imaging components, the imaging components placed so as to deviate from an optical conjugate plane of the surface of the resist film,” as recited in claim 8.

Yamada, as shown in FIG. 1, discloses the control unit 150 of the electron-beam exposure device 100, including a data-management unit 153 storing exposure data in a buffer memory 154 and sending the sub-deflection data to a sub-deflector-deflection setting unit 155. See Yamada, col. 2, lines 5-26. Yamada further discloses an electron beam is emitted from an electron gun 10, as shown in FIG. 2A. Yamada, col. 10, lines

6-7. The emitted electron beam is incident on a wafer 14, wherein microdots 15 for scattering electrons of the emitted electron beam, are disposed on the surface.

However, Yamada only discloses emitting a single electron beam, and thus fails to disclose “projecting exposure beams output from a plurality of effective light sources,” as recited in claim 8 (emphasis added). Moreover, to the extent that microdots 15 of Yamada can reasonably be considered as corresponding to Applicant’s claimed “imaging components,” Yamada does not disclose that microdots 15 are “placed so as to deviate from an optical conjugate plane of the surface of the resist film,” as recited in claim 8. Yamada thus cannot anticipate claim 8.

### **III. Rejection under 35 U.S.C. § 103(a)**

Applicant respectfully traverses the rejections of claims 1-7 under 35 U.S.C. § 103(a). To support a rejection under 35 U.S.C. § 103 the clear articulation of the reason(s) why the claimed invention would have been obvious must be provided by the Examiner. Such an analysis should be made explicit and cannot be premised upon mere conclusory statements. See MPEP § 2142, 8th Ed., Rev. 6 (Sept. 2007). “A conclusion of obviousness requires that the reference(s) relied upon be enabling in that it put the public in possession of the claimed invention.” MPEP § 2145. Furthermore, “[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the results would have been predictable to one of ordinary skill in the art” at the time the invention was made. MPEP § 2143.01(III), (internal citation omitted). Moreover, “[i]n determining the differences between the prior art and the claims, the question under 35 U.S.C. § 103 is not whether the differences

themselves would have been obvious, but whether the claimed invention as a whole would have been obvious.” MPEP § 2141.02(I), (internal citations omitted).

Here, the claimed invention as a whole is not obvious for at least the reason that the references, whether taken alone or in combination, fail to teach or suggest every element recited in the claims.

Sato fails to teach or suggest a combination including at least “measuring inspection images of the inspection patterns, and processing the inspection images with the reference image data so as to provide a plurality of inspection image data,” and “determining an abnormal inspection image by the inspection image data,” as recited in amended claim 1.

Sato discloses an inspection method of an exposure apparatus including rendering the wafer 5 and the photomask 3 non-conjugate with respect to the projection optical system. See Sato, paragraph [0060], and FIG. 2. Sato further discloses determining a shape of a diffraction light pattern as a reference, selecting patterns each of which is most similar to this reference pattern from the five kinds of photoresist patterns. See *Id.*, at paragraph [0067] and FIGs. 4 and 5. In addition, Sato discloses measuring a change of the light transmittance depending on the path of the projection optical system in a state in which the photomask and the wafer are not conjugate with respect to the projection optical system. See *Id.*, at paragraph [0070].

Sato, however, provides no disclosure of “processing the inspection images with the reference image data so as to provide a plurality of inspection image data,” as recited in amended claim 1 (emphasis added). Accordingly, Sato also fails to disclose

“determining an abnormal inspection image by the inspection image data,” as also recited in amended claim 1 (emphasis added). Claim 1, as a whole, is not obvious in view of Sato.

Furthemore, because Sato provides no disclosure, suggestion, or motivation of at least “provid[ing] a plurality of inspection data,” from “processing the inspection images with the reference image date,” the claimed invention, in providing such processing, is not obvious in view of Sato for this additional reason.

Hiroi fails to cure the deficiencies of Yamada. Hiroi, in addition to the description provided above, discloses inputting specific parameters for correction at the time of the inspection. Hiroi, col. 17, lines 41-47. However, Hiroi does not provide a disclosure of, suggestion, or motivation for “provid[ing] a plurality of inspection data,” from “processing the inspection images with the reference image date.” Accordingly, claim 1, as a whole, is also not obvious in view of Sato and Hiroi.

Applicant further notes that consistent with the claimed invention an inspection pattern having a minute defect image, or an inspection pattern having a variation in the diameter of the effective light source image can be easily detected, by comparing the claimed “inspection image data” with the arbitrarily selected “reference image data.” Thus, inspection processing of the claimed illumination optical system can be implemented within a short time. Applicant submits that claim 1 is not obvious in view of Sato and Hiroi for this additional reason.

Because claim 1 is not obvious in view of the prior art references, the rejection of claim 1 under 35 U.S.C. § 103(a) is improper. Accordingly, Applicant respectfully requests that the Examiner withdraw the rejection of claim 1 under 35 U.S.C. § 103(a).

If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q. 2d 1596 (Fed. Cir. 1988). Accordingly, Applicants respectfully request that the Examiner withdraw the rejection of dependent claims 2-7 under 35 U.S.C. § 103(a).


In view of the foregoing amendments and remarks, Applicant respectfully requests reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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